

Calculus Warm Up # 7-3

BC - MC practice:

Pick up a half sheet on the stool.

1.

Which of the following series is absolutely convergent?

(A) $\sum_{n=1}^{\infty} (-1)^{n+1} \frac{1}{2n}$

(B) $\sum_{n=1}^{\infty} (-1)^{n+1} \frac{1}{\sqrt{n}}$

(C) $\sum_{n=1}^{\infty} (-1)^{n+1} \frac{n}{n+1}$

(D) $\sum_{n=1}^{\infty} (-1)^{n+1} \left(\frac{1}{2}\right)^n$

2.

The third-degree Taylor polynomial for the function f about $x = 0$ is

$T(x) = 3 - 4x + 2x^2 - 3x^3$. Which of the following tables gives the values of f and its first three derivatives at $x = 0$?

(a)

x	$f(x)$	$f'(x)$	$f''(x)$	$f'''(x)$
0	3	-8	6	-12

(b)

x	$f(x)$	$f'(x)$	$f''(x)$	$f'''(x)$
0	3	-4	2	-3

(c)

x	$f(x)$	$f'(x)$	$f''(x)$	$f'''(x)$
0	3	-4	4	-18

(d)

x	$f(x)$	$f'(x)$	$f''(x)$	$f'''(x)$
0	3	-4	4	-9

HW Questions: p. 715

Due FridayClassworkHW Quiz by group

WU's (2 weeks)

10.8, p. 623 (2 days)

2009 FR

10.9, p. 630

BC - FR Practice
(purple)

12.5, p. 715

HW: finish purple FR

BC - FR Practice (purple)
Classwork

Name

No calculator is allowed for problems on this part of the exam.

1. Consider the function f given by $f(x) = xe^{-2x}$ for all $x \geq 0$.(A) Find $\lim_{x \rightarrow \infty} f(x)$.(B) Find the maximum value of f for $x \geq 0$. Justify your answer.(C) Evaluate $\int_0^{\infty} f(x) dx$, or show that the integral diverges.

(purple - backside)

2. The function f is defined by the power series

$$f(x) = \sum_{n=0}^{\infty} \frac{(x-2)^n}{3^n(n+1)} = 1 + \frac{x-2}{3 \cdot 2} + \frac{(x-2)^2}{3^2 \cdot 3} + \frac{(x-2)^3}{3^3 \cdot 4} + \dots + \frac{(x-2)^n}{3^n(n+1)} + \dots$$

for all real numbers x for which the series converges.

- (A) Determine the interval of convergence of the power series for f . Show the work that leads to your answer.
- (B) Find the value of $f''(2)$.
- (C) Use the first three nonzero terms of the power series for f to approximate $f(1)$. Use the alternating series error bound to show that this approximation differs from $f(1)$ by less than $\frac{1}{100}$.